FEBRUARY 2005

Safety Smarts

City of Tempe – Environmental, Health and Safety Section

Visit our intranet site at http://www1.tempe.gov/hpcc

Safety Programs

Inside

This is a Quarterly informational publication for City of Tempe employees. If you have comments or suggestions please contact the Environmental, Health and Safety Section.

The City of Tempe has several written safety programs that apply to all employees. Written plans are developed based on Occupational Safety and Health Administration (OSHA) requirements.

Programs are developed and reviewed by City of Tempe employees for specific operations performed in Tempe. But surprisingly there are still employees and Supervisors who are not aware of these programs.

However, not knowing does not keep you out of trouble during a compliance inspection.

The EHS Section coordinates four of these written programs:

- Confined Space Operations
- Hearing Conservation
- Hazard Comm.
- Respiratory Protection

The primary purpose of each of these plans is to ensure Tempe employees have the safest working environment and go home at the end of each day without *any* injuries. Each plan is a procedure that provides guidance on how to work safely and within the context of the law.

The hardest thing to do is determining "what" applies and what does not apply. Many of the OSHA standards are broad and cover a wide range of activities. Here are the basics of each of these programs.

HazCom

Better known as the "Right-to-Know" standard and always associated with Material Safety Data Sheets (MSDS). Requires employers to inform employees of hazardous chemicals that they use. The EHS Section has partnered with several Departments and will soon be unveiling a new software program that ensures city wide compliance.

Hearing Conservation

Sadly, this is one of the most preventable workplace injuries. Injury occurs gradually over time and is always permanent. This program requires monitoring and hearing testing for employees who perform operations involving loud or sudden impact noises above 85dB.

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Disposal of City Generated Hazardous Waste

With tax day just around the corner most of us can relate to the frustrations of gathering all the information needed for our tax returns. Making a simple mistake can result in an audit, everything under the microscope. Now imagine trying to keep records throughout the year on not just your taxes but 19 others.

The City of Tempe has 20 EPA registered sites that dispose of hazardous waste throughout the year. Hazardous waste regulations are specific on what a generator (The City) must keep as far as records. To understand how this works it helps to know the very "basics".

The Manifest

The manifest is a federal document that is filled out by the generator that includes the name of the waste, amounts, type and has to be signed by the generator, transporter and disposal facility. A copy is given to the generator before the transporter leaves the site. While that copy is important to keep, the final copy is the record that indicates the waste arrived safely at the disposal facility. The final copy is signed by the disposal facility and a copy is sent back to the generator.

If this copy can not be produced during an ADEQ visit, it can lead to serious violations. It must be kept by the generator or more specifically the EPA registered site.

So Why the Fuss

During 2004 over 100,000 pounds of waste material was transported for disposal or recycling from the City of Tempe. Not all of this waste was hazardous, but records of disposal were generated. We have all seen the news stories of illegally disposed of waste being found abandoned in some vacant building, the desert or even a disposal facility that did not dispose of the waste correctly. Now picture that news clip with the words "City of Tempe" and your department. A public relations nightmare and you are center stage.

Insurance

The City of Tempe has several disposal companies on contract. Each of them has met stringent criteria on liability insurance, EPA compliance, and proof of certifications. In most cases, a site visit of the disposal facility is made by City staff to ensure that what is on paper is what is happening at the facility.

To further insure proper handling and disposal of our waste, the EHS Group does not pay the bill until a Certificate of Disposal is received. What this means is, the company is notifying us in writing that the waste was disposed of in the manner that we agreed upon and is not laying in the bottom of some landfill.

It is important to remember that Federal Law holds the generator responsible for waste that is generated no matter if it does end up in a dump site or even an approved landfill that leaks. If it gets into the environment anywhere along the way, we are responsible for the clean-up. That is major reason why 90% of the waste generated by the City is disposed of by incineration instead of land filling.

It is Easy

Like with your taxes, it is often easier to let those that have the training and experience deal with your records and in this case your waste. The EHS Group will pack, schedule transportation and ensure that the waste is disposed of correctly. More importantly you get your records. The amount (the weight) that is disposed of is also very important. If you would like help with your waste contact the EHS group at 2818 or 2819.

Safety Assessments

There are over 1,008 pages in 29 CFR 1910, OSHA Standards for General Industry and to top that it all is in small font. This is the document that identifies what safety regulations apply to the City of Tempe work force. These regulations apply to you regardless if you know about them or not.

The mere mention of OSHA regulations makes most of us quiver at the thought of added cost and more time that will be needed to perform simple tasks. However, it is important to know that these standards are developed for one specific purpose, your safety. Regulations are developed typically based on the number of injuries or fatalities in a given job tasks. Most of us have not experienced a friend or a co-worker who has been seriously injured or worse killed in an industrial accident. In organizations where this has occurred there is always an overwhelming sense of urgency to do everything possible to prevent another occurrence. An injury or fatality that occurs in the workplace is typically labeled an "accident." In reality there are instances where everything that could be done to protect employees was but something just went wrong, resulting in an accident.

The sad truth is, in almost every accident if the employees would have taken just a minute to review or size-up the task at hand, the accident could have been prevented.

Most employers find out after the accident what regulations apply; typically in the form of a citation. Simple preventive measures when not put into place can result in an organization being fined thousands of dollars should an accident occur.

There is Help

During the past year several Departments within the City have requested assistance from the EHS Section.

Assistance is in the form of an assessment, which is basically an informal inspection. "The entire process and work area is reviewed and compared to the various standards," said David Tavares, Hazardous Materials Supervisor.

An assessment typically takes less than an hour to perform. Once the on-site portion is completed the assessment team researches operations and compares them to any standards that apply. A written report is completed and provided to the Department.

The report provides a brief narrative of what was assessed, details findings and provides recommendations or requirements to protect the health and safety of employees.

"The assessment team will always provide a solution for any concern that they find," Tavares said. One important piece of the process is that the department is provided with written documentation on the findings and solutions. "It does not stop there, we continue to assist, until the Department no longer needs our help," Tavares said. Tavares admits that written documentation may scare some groups away, but adds "the ultimate goal is to provide the safest work environment for our employees and lessen the City's liability."

In all things OSHA the buck stops with the senior most person responsible for overseeing employees. It is important to remember that OSHA is an organization that is specifically for employees. A Health and Safety Assessment can ensure that our employees are protected and the City is in compliance, avoiding injuries and monetary penalties.

For an assessment contact the EHS Section.

http://www1.tempe.gov/hpcc

Pesticides by John Nordin, PhD & Aristatek, Inc

You have heard it. Pesticides are poisons. Pesticides can be converted to chemical warfare agents. The pesticides themselves can be used as chemical warfare agents. The same technology (e.g. crop dusters) for dispersing pesticides can be used to disperse chemical warfare agents.

These statements are a mixture of truths, exaggerations, or are mostly false. Let us take a look at these chemicals and what they can do.

What is a Pesticide

A pesticide is an agent used to destroy pests. Pesticides include insecticides (destroys insects), herbicides (destroys plants), arachnicides (destroys spiders, mites, ticks), larvacides (destroys immature stages of insects such as grubs and caterpillars), fungicides (destroys fungus), rodenticides (kills mice, rats), molluscocides (destroys clams, snails, etc.) and fumigants. Sometimes insect repellents (such as DEET) and plant growth regulators are lumped in with discussions of pesticides. The agent is usually a chemical that destroys the unwanted pest, but the agent could also be a naturally occurring plant extract or bacteria that inflict a fatal disease on the targeted pest.

Much effort is spent developing new pesticides that are specific to the targeted pest but do not harm other life including humans. After the pesticide has accomplished its intended purpose, it should not persist in the environment. Some of the older pesticides developed decades ago have been since found to harm birds and other life, or were very poisonous to humans, and have been outlawed for use in the United States. Some may be produced or used in other countries for special use, such as use of DDT for control of mosquitoes where malaria is prevalent.

Pesticides may be applied to crops, to soils where crops are grown, buildings were crops are stored, ponds, forested areas, grasslands, applied topically to animals including humans, or put in cattle feed.

In lieu of pesticides, environmentally conscious people may advocate (1) control practices such as drainage of containers or ditches where mosquitoes may breed, (2) encouragement or addition of natural predators to control the unwanted pests, (3) crop rotation and (4) inclusion of “wild areas” within agriculture land. The wild areas provide a home for natural predators.

Pesticide Classifications

Pesticide formulations as used by the consumer contain one or more active ingredients plus various “inert” ingredients. The inert ingredients are there to give the formulation the desired physical characteristics so the pesticide can be easily and safely applied. Sometimes the formulations are mixed with fertilizers. Most formulations sold to the public are pellets, which are relatively dust free and release the active ingredient slowly. However some are applied as dusts or as aerosolized liquid droplets. Some are fumigants and are released as vapors or gases. Some are poison bait and are used for rodents, birds, cockroaches, etc...

Pesticides are classified into either chemical classes or use classes according to the active ingredient. The U.S. Environmental Protection Agency recognizes 1000+ active ingredients and almost 90,000 different brand name formulations. Roughly 40 new active ingredients are approved each year. Some active ingredients have been withdrawn from use in the United States because of harm to people or the environment. A complete list is at http://www.epa.gov/pesticides/science/models_db.htm#databases. The PEAC tool lists approximately 250 active ingredients including a few that have been withdrawn from use. The approximately 250 selected for display in the PEAC tool are or were either widely used or are relatively toxic.

Pesticide names (for active ingredients) are assigned by the International Organization for Standardization (England). The names assigned are unique and internationally recognized.

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Respiratory Program 2005

The latest revision to the City of Tempe, Respiratory Protection Program was unveiled at the end of 2004. The plan has several new training requirements to ensure employees who wear respiratory protection can use it safely by demonstrating working competencies.

The Tempe Police Department makes up the largest portion of the program with just over 350 employees. Program requirements are stringent with yearly requirements ranging from training and fit testing, to medical evaluations which must occur every-two years.

"The Police Department is such a large group that a real commitment had to be made by Management to ensure compliance," according to Scott Mosley, Program Administrator. "They (TPD) work 365–days a year 24-hours per day, so it takes a considerable amount of coordination and flexibility to achieve compliance," Mosley said. Members of EHS work directly with TPD Administration to schedule fit testing and training. New recruits are fit tested before they attend the academy. Fit testing has become almost a year round occurrence. "We just finished the 2004 cycle and have already begun scheduling the 2005 cycle to begin sometime in July", Mosley said.

In 2004 TPD incorporated the annual training requirements with required Advance Officer Training. "The commitment we have seen in the Police Department is extraordinary," Mosley said.

To ease some of the pressure the EHS Section is hoping to have computer based training (CBT) that is specific to the City Program in place by mid 2005. If you have questions regarding the Respiratory Program please contact the EHS Section.

Safety Programs – Continued from Page 1

Respiratory

The respiratory protection standard is specific to employees who wear any form of respiratory protection in the course of their job duties. This includes dust masks, self contained breathing apparatus and air purifying respirators. Training, medical clearance and fit testing are all required.

Confined Space

If you have an employee that has to enter a pit, manhole, vault, pipe or other similar area they probably are covered by this program. Identification and training are required.

Others Programs

Other programs that may relate to your work group are Bloodborne pathogens and Commercial Drivers License (CDL) programs which are administered by Risk Management.

If you have questions or need assistance visit our intranet site. Schedule a Health and Safety assessment on-line.

(See related article Page 3)

Information

Please visit the EHS intranet site. Copies of these programs plus links to OSHA relevant sites all within one simple click. Visit it today!

Pesticides *Continued*

The U.S. Environmental Protection Agency and California Department of Pesticide Regulation maintains a listing of brand name formulations.

A more complete listing of classifications with specific pesticide examples may be found at the EXTOXNET website developed by several state cooperative extension offices and maintained by Oregon State University, at http://extoxnet.orst.edu/tibs/pestgrp.htm .

The U.S. Department of Transportation classifies pesticides by chemical classes. UN (United Nations) shipping numbers reflect this. However the UN numbers also take into account the "inert ingredients" because they affect whether the pesticide is shipped as a liquid or solid, and the flammability of the liquid. The following pesticide classes and corresponding UN#s are listed in the 2004 Emergency Response Guidebook.

There are also generic listings for insecticide gases. The words "toxic" and "poisonous" are synonymous in the 2004 Emergency Response Guidebook, and n.o.s. means "not otherwise specified". However, "Liquid, toxic", "Liquid, toxic, flammable" and "Liquid, flammable, toxic" have different meanings as defined by DOT.

How Toxic are Pesticides to Humans

It depends upon the particular pesticide. Some are highly toxic and some are practically nontoxic. Some may be acutely toxic but display no long-lasting effects if and when the person recovers. Exposure to other pesticides may increase the risk of cancer or motor impairment later in life.

The U.S. National Library of Medicine maintains a data base on toxicity of chemicals including pesticides. To access this, go to http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB, and enter the pesticide name or its CAS number.

Acute toxicity is measured in terms of exposure of the chemical to a test animal, usually a rat. The dosage (mg of chemical per kilogram of body weight) which kills 50% of the test animals is called LD_{50} . Exposure may be by ingestion, skin contact (a patch containing the chemical is attached to the animal), or by inhalation. LC_{50} is the concentration of chemical in the air that kills 50% of the animals over a specified time period, usually 1 or 4 hours. The inference is made that the animal toxicity data can be transferred to humans. Pregnant females and the very young are often more susceptible.

Can Pesticides Be Used As Chemical Warfare Agents?

Another question can be asked: Can pesticides be converted to chemical warfare agents?

Most pesticides exhibit little or no toxicity. Only a very few are classified by the U.S. Environmental Protection Agency as "Highly Toxic". The "Highly Toxic" pesticides are either now banned from use in the United States or are classified as "Restricted Use", that is they may be obtained and used only by certified operators. However, old stockpiles may exist, and pesticides banned in the United States might be used in other countries.

There are many other toxic industrial chemicals in wide use (e.g. concentrated sulfuric acid, anhydrous ammonia, hydrogen chloride, etc.), which are highly toxic if inhaled but are not normally thought of as chemical warfare agents. Chlorine, a widely used industrial chemical, has been used as a chemical warfare agent during World War I. The main reason that pesticides are linked to chemical warfare agents is that some pesticides and some chemical warfare agents kill by inhibiting the enzyme cholinesterase. This enzyme is found in all animal life, including humans and insects. The enzyme is important in functioning of the nervous system.

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Pesticides *Continued*

Symptoms of cholinesterase inhibition are as follows:

Mild Poisoning:
Tiredness, weakness, dizziness, nausea, and blurred vision. Symptoms appear usually within 4 to 24 hours of exposure in the case of pesticides, sooner in the case of toxic nerve agents.

Moderate Poisoning: Headache, sweating, tearing, drooling, vomiting, tunnel vision, and twitching. Symptoms appear usually within 4 to 24 hours of exposure in the case of pesticides, sooner in the case of nerve agents.

Severe Poisoning (a single large dose or repeated smaller dosages):

Abdominal cramps, involuntary urination and/or defecation, muscular tremors, staggering gait, pinpoint pupils, hypotension (drop in blood pressure), slow heartbeat, difficulty breathing, possible convulsions, possible coma, and possible death. Symptoms can appear within seconds (by inhalation) or minutes (skin contact) in the case of lethal doses of nerve agents.

Some Banned Pesticides

Aldrin
Chlordane
Dieldrin
Endrin
Malathion
Parathion

Aldrin, Dieldrin Paraquat and parathion
may also be possible cancer agents.

The chemical warfare agents which inhibit cholinesterase include the nerve agents Sarin, VX, Soman, and Tabun. Pesticides that inhibit cholinesterase fall under the general class of organophosphorus pesticides and to a lesser extent the carbamate pesticides. The nerve agent sarin was originally developed in Germany prior to World War II as a pesticide for killing aphids.

There are a couple of important differences between nerve agents and pesticides that make it difficult for pesticides to be used as chemical warfare agents. The main difference is that the nerve agents are much more powerful, and can kill by inhalation or by absorption through the skin. It is much more difficult for a person to kill himself by inhalation of a pesticide or by applying the pesticide to the skin. There have been deaths by ingestion of toxic pesticides.

The nerve agents (tabun, sarin, etc.) are absorbed rapidly through the skin whereas the pesticides are more slowly absorbed. A dermal patch with the chemical underneath the patch was attached to the test animal for days to allow time for absorption. Realistically, a person can shower and wash off the pesticides. Nevertheless, skin contact with many pesticides must be avoided.

Phorate is one of the most toxic organophosphorus pesticides still in use in the United States. Deaths have occurred due to skin absorption [case history studies at http://toxnet.nlm.nih.gov/cgi-bin/sis/search/f?./temp/~mpj1wV:1]. Repeated exposure can result in the person developing increased susceptibility. Relative to other pesticides it is more rapidly absorbed through the skin. China is a major exporter of this and other toxic pesticides [see http://www.shiji-pesticide.com/].

Pesticides which display cholinesterase activity have very low vapor pressures. They must be dispersed as a dust or dissolved in a liquid and dispersed as an aerosol. Because relatively large amounts are required to kill, they are less attractive as a chemical warfare agent. Nevertheless, exposure to even small amounts of some of the more toxic pesticides can result in headaches, nausea, and possibly other incapacitating symptoms.

Cholinesterase inhibition was the subject of the June 2003 AristaTek Newsletter article, at http://www.imakenews.com/aristatek/e_article000158286.cfm.

Can pesticides be converted to nerve agents? Not easily, although some may be convertible to more toxic substances. The government HSDB website gives details on the raw ingredients required to manufacture various pesticides. The raw ingredients for some pesticides are quite toxic.

Personal Protective Equipment

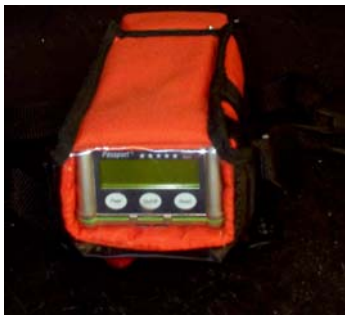
Information on Personal Protective Equipment for the more toxic pesticides is in the NIOSH Pocket Guide, the 2004 Emergency Response Guidebook, and in the HSDB website at http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB .

Generally, positive pressure fully protective suits fitted with self-contained breathing apparatus (SCBA) are required for ambient concentrations above "Immediately Dangerous to Life and Health" (IDLH). A full-face piece respirator fitted with a P100 filter and organic cartridge may be used for many pesticides if the ambient concentration is below IDLH. There are variations on this depending upon the chemical. Air-Supplied systems are also permitted under certain situations. For some pesticides, positive pressure "escape hoods" with an air-purifying respirator are permitted at concentrations above IDLH up to some maximum level.

http://www.aristatek.com/

Calibration Problem Leave One Man Dead

Source: SafetyAlert for Supervisors



Remember the value of confirming that instruments that monitor dangerous chemicals are working properly. A poorly calibrated device could be deadly.

Company
Eastman Chemical Co., Kingsport, TN

Business
Chemical Processor

Agency
Tennessee Division of Occupational Safety and Health

Company
$76,000 (proposed)

Reason for Fine
Chemical monitoring instruments were not working properly.

Note
A worker was exposed to hazardous vapors leaking from a faulty flange. The exposure caused breathing problems and the worker was hospitalized. He lost consciousness that night and he never regained it. He died 11 days later.

Did You Know?

The EHS Section and the Tempe Fire Department have trained technicians that are certified to repair gas detection equipment.

Gas detection equipment is available to all trained City of Tempe employees.

Find out more, contact the EHS Section or visit our web site.

Need to get in touch with us...

The ***Environmental, Health and Safety Section*** are here to assist you in all your safety and hazardous materials needs.

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Raymond Hagen	Hazmat/Safety Specialist	raymond_hagen@tempe.gov	350-2818

SAFETY EQUIPMENT

Do you wear safety equipment (PPE) like gloves, glasses or boots? You are required to perform a Job Hazard Analysis (JHA) on the process and selection of your safety equipment. This requirement can be found in 29 CFR 1910.132(d), Subpart I – Personal Protective Equipment. Contact EHS for assistance.

Visit our intranet site
http://www1.tempe.gov/hpcc